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10/041,029	12/28/2001	Konstantin Volodarsky	042496 0269289	3769

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EXAMINER

NICOLAS, WESLEY A

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 10/041,029	Applicant(s) VOLODARSKY ET AL.	
	Examiner Wesley A. Nicolas	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 65-88 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 65-88 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is in response to the Amendment dated January 12, 2004 and arguments submitted October 17, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 65-88 are currently pending in this application.

Claim Rejections - 35 USC § 112

1. Claims 65-72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The 35 U.S.C. § 112 rejections with respect to claims 65-72 have been **withdrawn** in view of the amendment submitted by Applicant which corrects antecedent problems with respect to "chamber".

Claim Objections

2. Claim 68 is objected to because of the following informalities: line 1 "alt" should be changed to "at".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. Claims 65-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamikawa et al. (EP 0 855 736 A2).

The 35 U.S.C. § 102(b) rejection of claims 65-67 and 69 has been **withdrawn** in view of Applicant's argument submitted October 17, 2003 and amendment submitted January 12, 2004.

The 35 U.S.C. § 102(b) rejection of claims 68 and 70 have been **maintained** and are as repeated below for Applicant's convenience.

Claim 68 is rejected because Kamikawa et al. teach a method of carrying out at least two processing steps on a workpiece, the method comprises the steps of:

- carrying out a second processing step on the workpiece in an upper section after positioning the movable guard between the upper section and the lower section of the chamber (Fig. 25, numeral 72 separating upper chamber 42 from lower chamber 41 and Fig. 26, gas coming out of nozzles 85 and 86);
- repositioning the movable guard such that the workpiece can be lowered into the lower section of the chamber (Fig. 19, movable guard 72 out of the way);
- lowering the workpiece into the lower section of the chamber (Fig. 29, workpiece "W" in lower chamber 41);
- carrying out a first processing step on the workpiece in the lower section of the chamber (Fig. 22, workpiece "W" in cleaning bath);

Claim 70 is rejected because Kamikawa et al. teach that the second processing step comprises drying a surface of the workpiece (cols. 13-18 which specify drying of the wafer).

Claim Rejections - 35 USC § 103

4. Claims 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamikawa et al. (EP 0 855 736 A2), and further in view of Schild et al. (5,569,330).

The 35 U.S.C. § 103 rejection of claims 71-72 as set forth in the previous Office action has been **maintained** and is repeated below for Applicant's convenience.

Kamikawa et al. are as applied, argued, and disclosed above and incorporated herein and further teach the application of heated gas (col. 14, line 48) but fail to specifically teach providing gas selected from the group consisting of O₂, CF₄, Cl₂, and NH₂, or the specific heating of the workpiece.

Schild et al. teach the application of ozone (O₃) to the workpiece (col. 4, lines 56-61 and col. 5, lines 51-53).

Claim 71 is rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Kamikawa et al. invention to use a gas such as ozone or oxygen as taught by Schild et al. because Schild et al. teach that application of ozone allows a chemical oxide to grow on the substrate surface which provides a hydrophilic surface on the substrate (col. 4, lines 56-61). Although Schild et al. does not specifically teach application of oxygen (O₂), one of ordinary skill in the art would reasonably expect that oxygen would be present given the inherent instability of ozone and its likelihood of disassociation.

Although neither Kamakawa et al. nor Schild et al. disclose the heating of the wafer during application of gas, claim 72 is rejected because wafer heating would have

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been an inherent property/result given the application of a heated gas to the chamber as taught by Kamikawa et al. (col. 14, line 48).

New Rejection

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 79-80 and 82-88 are rejected under 35 U.S.C. 102(e) as being anticipated by Ting et al. (6,187,152).

Claim 79 is rejected because Ting et al. teach a method of processing a workpiece using a vertical multi-chambered processing module comprising the steps:

- removing conductive material from the workpiece in a first chamber (col. 4, lines 25-39);
- transferring the workpiece to a second chamber vertically disposed with respect to the first chamber (col. 4, lines 40-55 and col. 10, line 55 to col. 14, line 30);
- isolating the first chamber from the second chamber (fluid containment ring 70); and
- modifying the workpiece in the second chamber (col. 4, lines 40-55 and col. 10, line 55 to col. 14, line 30).

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Claims 80 and 82-88 are rejected because Ting et al. further teaches that the removing step further includes the step of depositing material on the workpiece (col. 4, lines 25-39) or polishing the conductive material from the workpiece (col. 4, lines 25-39). Ting et al. further teaches that the modifying step includes cleaning the surface of the workpiece (col. 13, lines 53-67) or chemically etching the workpiece (col. 4, lines 25-39), and the workpiece is in a substantially horizontal position (Fig 1. numeral 15).

7. Claims 65-67, 69, and 72-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamikawa et al. (EP 0 855 736 A2), and further in view of Ting et al. (6,187,152).

Kamikawa et al. teach a method of carrying out at least two processing steps on a workpiece, the method comprising the steps of:

- lowering the workpiece into a lower section of a chamber (Figs. 20 and 21);
- carrying out a first processing step on the workpiece in the lower section of the chamber (Fig. 22 where "W" is in solution);
- raising the workpiece from the lower section to an upper section of the chamber (Fig. 24, "W" in upper chamber 42);
- positioning a movable guard between the lower section and the upper section (Fig. 25, numeral 72 separating upper chamber 42 from lower chamber 41); and
- carrying out a second processing step on the workpiece in the upper section (Fig. 26, gas coming out of nozzles 85 and 86).

Kamikawa et al. fail to specifically teach that said first processing step removes (*i.e.* etches) material from the workpiece.

Ting et al. teach that said first processing step removes (*i.e.* etches) material from the workpiece (Abstract: "multi station processing chamber used to deposit and/or remove a material on a semiconductor wafer").

Claims 65-67 and 69 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Kamikawa et al. invention to remove/etch material from the workpiece as taught by Ting et al. because Ting et al. teaches that one can remove/etch material from a workpiece (col. 4, lines 25-39) without exposure to air (cols. 10-11) which increases the processing yield and minimizes likelihood of the formation of defects on the substrate.

Claims 72-78 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Kamikawa et al. invention to use the etching/deposition steps taught by Ting et al. because Ting et al. further teaches of depositing material on the workpiece (col. 4, lines 25-39) or polishing the conductive material from the workpiece (col. 4, lines 25-39). Ting et al. further teaches that the modifying step includes cleaning the surface of the workpiece (col. 13, lines 53-67) or chemically etching the workpiece (col. 4, lines 25-39) which would have allowed all the processing steps to be performed in one apparatus minimizing exposure to air (cols. 10-11).

Allowable Subject Matter

8. Claim 81 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

The specific step of electro chemically mechanically depositing conductive material on the workpiece combined with transferring the workpiece to a second chamber vertically disposed with respect to the first chamber and isolating the first chamber from the second chamber was not taught or suggested by the prior art of record.

Remarks - Response to Arguments

10. Applicant's arguments with respect to claims 65-88 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued independent claims 65 and 68. While the 35 U.S.C. § 102 claim rejection of claim 65 was withdrawn and a new rejection was applied, Applicant's arguments are not convincing in light of the newly applied reference of Ting et al.

Regarding claim 68, Applicant argues that since Kamikawa is used only for during and cleaning, there would be no reason to use Kamikawa to anticipated the instantly claimed invention. In response, Applicant in claim 68 claims nothing more than

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“processing steps” and states that a second processing step is performed in an upper section and a first processing step is performed in a lower section. Examiner sees no difference in claim 68 and the prior art of Kamikawa. Although Applicant names a “first” and “second” processing step, just because the “second” processing step is listed first does not mean it has to occur first.

Since Applicant has not meaningfully addressed the dependent claims, Examiner has adequately addressed their rejection as set forth above.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

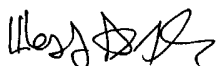
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Nicolas whose telephone number is (571) 272-1247. The examiner can normally be reached on Mon.-Thurs. from 7 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov> . Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Wesley A. Nicolas
Primary Examiner

April 6, 2004